

What is a back-pressure steam turbine?

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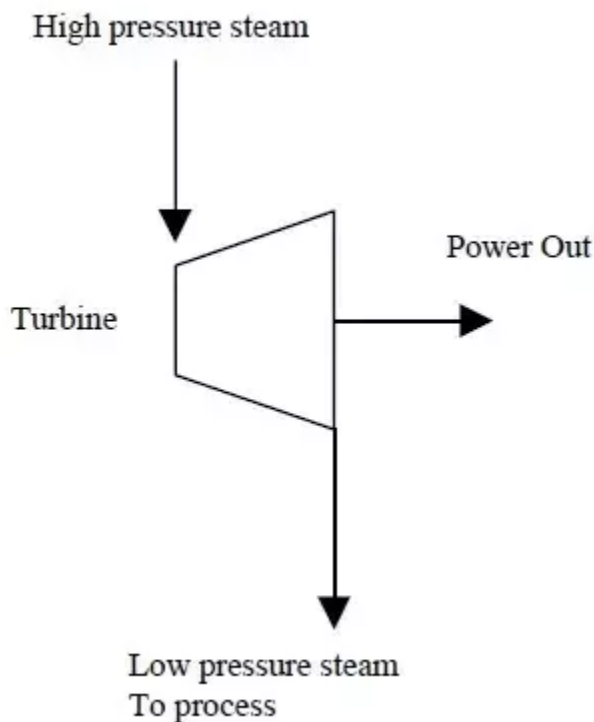
8 Answers



Vicky R, B.E Mechanical Engineering, Srinivasan Engineering College, Perambalur
Updated Nov 8, 2016



Back Pressure Steam Turbine is also called as *Non Condensing Steam Turbine* is mostly used in process steam industries or co-generation plants. The non-condensing steam turbine uses high-pressure steam for the rotation of blades. This steam then leaves the turbine at the atmospheric pressure or Higher Pressure.



- **Advantages:**

- The configuration of this steam turbine is very simple
- It is relatively inexpensive as compared to extraction steam turbine
- It requires very less or no cooling water

- Its efficiency is higher as it does not reject heat in the condensation process
- **Disadvantages:**
 - The biggest disadvantage of this type of steam turbine is that it is highly inflexible. The output of this turbine can't be regulated as it does not allow changing the pressure and temperature of steam in the turbine, therefore, it works best with the constant load.
 - The thermal load of this turbine defines the flow of steam mass which makes it difficult to change the output value. Other methods to regulate output reduce the efficiency of the overall system.

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Shantanu Maheshwari, former Senior Engineer at Triveni Turbines (2015-2018)

Answered Dec 12, 2017



Back pressure turbine is basically positive exhaust turbines. Exhaust temperature is higher than atmospheric temperature.

It is generally used in process plant and co-generation if power is secondary and steam is primary factor.

It comes with a sentinel valve which release extra back pressure.

It will be less effective as compared to condensing set but serves the purpose.

Exhaust is directly taken to process and since pressure is higher than atmospheric pressure, there is no need of condensor

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Sagar Orekonde, works at TATA Power

Answered Jan 15, 2017



Back pressure turbines are those steam turbines where steam is not condensed back into water, steam from the exhaust is used for some others process. In these turbines there will be no condenser.

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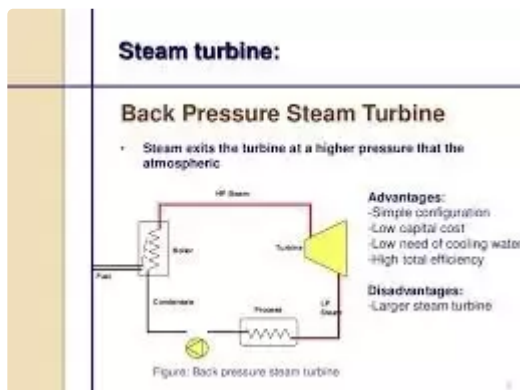
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Lakshminarayana K S, PhD Mechanical Engineering, Jawaharlal Nehru Technological University, Anantapur (2015)

Answered Jan 17, 2017



Back pressure steam turbine is a non-condensing steam turbine which operates with an exhaust equal to or in excess of atmospheric pressure. The features are as follows:

[1] Back pressure steam turbine uses exhaust steam for lower pressure steam process loads.^f

[2] It is available in smaller sizes and pass large amounts of steam per MW of output (low efficiency).^f

[3] It produces less useful work than a condensing turbine, but since the unused steam from the turbine is passed on to process loads, the lower turbine power generation efficiency (less than 35%)

are not a major issue.^f

[4] It is very cost effective when paralleled with pressure reduction valves (PRV), providing an efficient use of the pressure reduction requirements. ^f


[5] It is less costly than condensing turbines.

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Chris Judge, 50 years an engineer
Updated Mar 4, 2017




A back-pressure turbine is used where steam is generated at medium or high pressure in a watertube boiler but the process, such as a paper mill or chemical plant, needs steam at low pressure. The steam pressure is reduced by expanding it through a back-pressure turbine, producing a significant amount of energy and desuperheating the steam at the same time, so it can be used as process steam.

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Bill Gurry, Senior Vice-President, Consulting Director at Marsh & McLennan (2014-present)
Answered Sep 7, 2017



When steam is “finished” going through a steam turbine it then exits. If it exits into a vacuum condenser and the steam condenses, then that condensate ultimately is reused to create steam again within a closed cycle.

Should the steam not go into a vacuum condenser and instead is then used for other purposes such as steam heating or for various commercial uses in processing for example, then that steam (with its inherent pressure), is called back pressure (as opposed to being in a vacuum).

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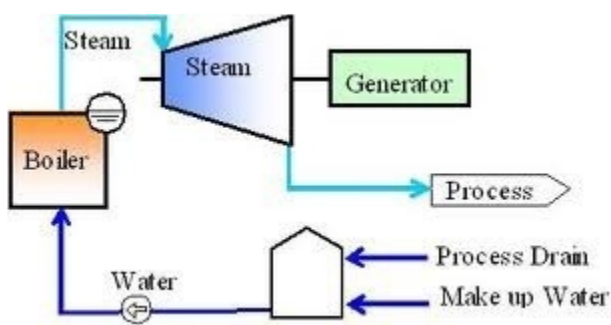
Chandramohan Panakkal

Answered Mar 7



Originally Answered: What is a back pressure in a steam turbine?

In non condensing turbines steam is used to send for some process. after doing work in turbine. This exhaust pressure is called back pressure and such turbines are known as back pressure turbines.



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Priyanka Deo, B.E. Mechanical Engineering, Cummins College of Engineering for Women, Pune (2016)

Answered Sep 8, 2017



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<http://www.midwestchptap.org/Arc...>

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